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DEPARTMENT OF THE ARMY  
OFFICE OF THE ADJUTANT GENERAL  
WASHINGTON, D.C. 20310

IN REPLY REFER TO  
AGAM-P (M) (9 Jan 68) FOR OT RD 674083

11 January 1968

SUBJECT: Operational Report - Lessons Learned, Headquarters, 93d  
Engineer Battalion (Construction), Period Ending  
31 October 1967

TO: SEE DISTRIBUTION

1. Subject report is forwarded for review and evaluation by USACDC in accordance with paragraph 6f, AR 1-19 and by USCONARC in accordance with paragraph 6c and d, AR 1-19. Evaluations and corrective actions should be reported to ACSFOR OT within 90 days of receipt of covering letter.
2. Information contained in this report is provided to insure appropriate benefits in the future from Lessons Learned during current operations, and may be adapted for use in developing training material.

BY ORDER OF THE SECRETARY OF THE ARMY:

*Kenneth G. Wickham*

KENNETH G. WICKHAM  
Major General, USA  
The Adjutant General

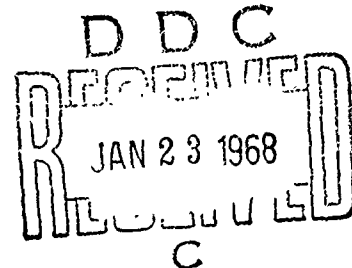
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DEPARTMENT OF THE ARMY  
Headquarters, 93d Engineer Battalion (Const)  
APO San Francisco 96370

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SUBJECT: Operational Report - Lessons Learned (RCS CSFOR-6S) for  
Quarterly Period Ending 31 October 1967

THRU: Commanding Officer  
34th Engineer Group (Const)  
APO 96291

Commanding General  
20th Engineer Brigade  
APO 96491

Commanding General  
US Army Engineer Command Vietnam (Prov)  
ATTN: AVCC-P&O  
APO 96491

Commanding General  
United States Army Vietnam  
ATTN: AVHGC-DH  
APO 96307

Commander in Chief  
United States Army, Pacific  
ATTN: GFOR-OT  
APO 96588

TO: Assistant Chief of Staff for Force Development  
Department of the Army (ACSF/ODA)  
Washington, D.C. 20310

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SUBJECT: ORLL for Quarterly Period Ending 31 Oct 67

SECTION 1: SIGNIFICANT ORGANIZATION OR UNIT ACTIVITIES

1. COMMAND a. Mission: The mission of the battalion is construction in support of a division base camp and construction and security of an all weather C-130 capable, operational self supporting airfield facility. Each day for the period was operational toward the mission end.

b. Command and Staff: The Command of the battalion remained with LTC C. W. GUTH, CE, 067689, during the period. The majority of the command and staff positions were changed as a result of directed personnel infusion.

- (1) Executive Officer: MAJ. NORMAN B. GATES, CE, 073554  
Vice - MAJ MARCO A. LUGO-RAMIREZ, CE, 0977716
- (2) S-1: 1LT JOSEPH L. SOCZEK JR, CE, 05535907  
Vice - CPT ROBERT F JONES, AG(CE), 05314640
- (3) S-3: MAJ DAVID G COTTS, CE, 087071  
Vice - CPT WILLIAM T KIRKPATRICK, CE, 093790  
Vice - MAJ ROGER M FOLEY, CE, 081792
- (4) S-4: CPT WILLIAM T KIRKPATRICK, CE, 093790  
Vice - CPT ROBERT D WOLFF, CE, 0F105093
- (5) Engr Equip Maint Off: CPT WILLIAM H BRUNNER,  
CE, 0F101887  
Vice - 1LT JOHN M SHANK, CE, 05024227
- (6) CO HHC: 1LT JOHN M SHANK, CE, 05024227  
Vice - CPT JAMES W BRADDOCK, CE, 05323893
- (7) CO Co B: CPT KRAIG U HANSEN, CE 09593  
Vice - 1LT KEVIN J McLOUGHLIN, CE, 0F103494  
Vice - CPT WILLIAM A SMAYDA, CE, 098142
- (8) CO Co D: CPT ROBERT D WOLFF, CE, 0F105093  
Vice - CPT DONALD S DUSENBURY, CE, 098683
- (9) Chaplin: CPT ROBERT E BARKER, CHC, 05701592  
Vice - MAJ RAY E MILLER, CHC, 02305702
- (10) Surgeon: CPT GARL D WALKER, MC, 05541429
- (11) CO 67th Engr Co (DT): 1LT DALE J SKINNER,  
CE, 05233935  
Vice - CPT RICHARD F ROBERT, CE, 05019641

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c. Assignments: The battalion remains assigned to the 34th Engineer Group, 20th Engineer Brigade and the US Army Engineer Command Vietnam (Provisional).

d. The 67th Engineer Company (DT) remains attached to the battalion.

e. Stationing: The battalion has remained in the area of the yet to be constructed base camp adjacent to Long Thanh North Airfield (which is under construction) and 2 kilometers Southeast of Camp Martin Cox. The battalion cantonment is known locally as Camp Castle (YS1498). The 67th Engineer Company (DT) minus two (2) dump truck sections in direct support of the 27th Engineer Battalion (Cbt) at Long Giao, and supported by the quarry section from Company A, displaced to a base camp location (YS3662) near Ba Ria on 12 Aug 67.

## 2. PERSONNEL, ADMINISTRATION, MORALE, DISCIPLINE:

### a. Personnel:

(1) At the end of the reporting period the strength

was:

	<u>OFF</u>	<u>WO</u>	<u>EM</u>	<u>Total</u>
Authorized -	34	8	973	1015
Assigned -	34	7	976	1017

(2) The following personnel turnover has occurred during the period:

	<u>OFF</u>	<u>WO</u>	<u>EM</u>	<u>Total</u>
Transfer Out	15	0	219	234
Transfer In	18	0	210	228

(3) The directed infusion during the period caused personnel changes which have required essentially a new start for every section and squad. The internal adjustments necessary from the external infusion has changed the NCO or officer supervisor for nearly every man in the battalion except for the Commanding Officer and the Sergeant Major. Most of the enlisted infusion occurred in a matter of days. The administrative load was excessive, the change was traumatic, the efficiency of the battalion suffered to a greater degree than it would have under infusion over a period of time.

(4) There were 18 persons that did not deploy with the battalion to Vietnam because of pending deferment action. All have joined or have been transferred from the battalion.

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(5) 127 permanent and 122 temporary hire local nationals are employed by the battalion. Desired skills are not all available, nor is the authorization of spaces adequate to meet the needs. As the Long Thanh area is developed, hopefully it will attract skills from the metropolitan areas. 6

b. Administration:

(1) Reports - During the period 437 battalion level reports and 71 one time reports have been submitted.

(2) The lack of in-country publications from USARV has continued to be a problem. The distribution of new USARV Regulations, while inadequate in initial quantity, is timely.

c. Morale: More factors than not, present during the period would point to low morale. Personnel turbulence, security of an isolated area with guard duty every 3 or 4 nights and long hard days, months of mud - rain - heat (as one EM put the problem: No place to stand that isn't knee deep in mud and you can't see half the time because of the dust in your eyes), many questions with no answers until the last minute, etc. Low morale is not a problem. The amount of work, the type of work and the difficulty facing each member of the battalion have been molded into a goal that the individual has been lead to believe is his. Policy to battalion level allows one-half a day free time for 14 consecutive days of work, if possible. Living conditions continue to improve. Rations have improved, Day rooms volley ball courts, and in nearby Bear Cat, swimming, miniature golf and a library and service club are now available. Morale in the battalion is high and continues to increase as dry weather approaches.

d. Discipline: Actions during the period are:

	<u>Art 15</u>	<u>Summary Court</u>	<u>Special Court</u>
Aug	40	0	3
Sep	35	0	0
Oct	<u>34</u>	<u>3</u>	<u>2</u>
Total	109	3	5

3. INTELLIGENCE AND COUNTER INTELLIGENCE: The unit has no assigned intelligence missions. The battalion intelligence NCO provides liaison with the 9th Infantry Division G2 and the US advisors at a nearby ARVN camp. In this manner he collects required information on enemy activity and planned actions by nearby combat units. The battalion requested and received an assigned area of operations (AO) which is 13 kilometers in circumference. This AO allows greater flexibility in the accomplishment of a battalion mission which is to secure the entire Long Thanh North Airfield Complex. Current guard mission requires 170 EM from the battalion each night.

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4. PLANS, OPERATIONS AND TRAINING:

7 a. The battalion has been primarily committed to base construction. Combat support has taken the form of equipment support to the engineer combat battalions of the Group.

b. Planning for construction of:

(1) Bear Cat (Camp Martin Cox), home of the 9th Infantry Division has greatly improved. It has been necessary to set up a Base Development Office (BDO) with one officer, two NCO's and 2 EM to coordinate the activities of the various units involved in self help construction with that of the battalion. Based on priorities established by the office of the deputy post commander the BDO supervises the self help construction from site layout through the turn over of the facility to the Sub Area representative for inclusion on real property records. BDO personnel control the release of materials for self help construction based on completion inspections of a given phase. This method provides quality construction of each phase before additional construction can be started. The design and drafting requirements, for the most part, have diminished to routine adaption of standard plans. The BDO enables the construction companies to concentrate on engineer troop construction and supervision in the camp.

(a) Self help construction has greatly increased the facility construction by leaps and bounds. Units, under engineer technical supervision, inspection and guidance, have completed, for all practical purposes, the following facilities in the Bear Cat area and are in various stages of construction in Long Thanh.

<u>Bearcat</u>	<u>sq ft</u>
Company HQ and Supply	15,558
Motor repair shop	10,440
GP warehouse	7,680
Dispensary	1,400
Headquarters	5,840
Billots	19,680
Mess	7,400
Chapel	2,280

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Royal Thai Area

Motor shops	1,440
GP warehouse	2,880
Dispensary	1,040
Headquarters	1,920
PX	4,000
Guardhouse	1,280
Mess	29,240

Long Thanh

HQ and supply	960
Billots	32,400

(b) The BDO has turned over to the sub area real estate branch, 460 buildings of the 601 completed, has 52 in process of turn over and 76 additional under construction in Boarcat. The turnover of Long Thanh is yet to come.

(2) Long Thanh North development has been a challenge. A liaison officer to the battalion from the future tenant units has the responsibility of providing the priority of construction and requirements for the facilities. Current policy dictates that design be accomplished at the lowest level practical. The time from which requirements in detail for each facility are received from the user, to the date of required occupancy does not allow lead time for normal design, planning, material procurement and construction. The resultant is that facilities are completed at or close to the time required, using materials from any source possible and using as-built/design plans. Battalion design requires criteria and parameters from higher command and customers in time to allow for review of plans and procurement of material. A liaison officer from the customer is necessary but it is also necessary that the customer be informed by his headquarters of his mission and more timing, in advance, to allow construction of the facilities prior to the time required.

c. Company A, in support of construction operations, provided 24 hour maintenance support, processed 4702 requisitions and completed 714 job orders. The equipment platoon was responsible for



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laterite pit operations which produced 246,750 cubic yards for the battalion use. In addition, 86,000 gallons of dust palliative were placed.

9 d. Company B, committed for the most part to Long Thanh North Airfield (CD 46-208-03-T-6S), expended 100,000 manhours and placed 450 cubic yards of concrete, 20,000 square feet of laterite pads and completed 12,000 square feet of buildings and hutments. The completed facilities include a concrete aircraft wash rack, a 20' x 48' avionics prefab and quonset, a 35 foot tall control tower which lacks only the electrical component package installed for operations, a 20' x 200' wood frame technical supply and repair building, constructed along the backside of the hangar. The latter structure increases the hangar utilization and efficiency and precludes several small independent hutments. On the north side of the field, in an area slated for an aircraft maintenance unit, construction has begun on a 75' x 202' steel aircraft hangar which is approximately 50 percent completed. The foundation pad of laterite has been placed for hangar Number 3 (175' x 190'). Two technical supply buildings have been completed except for electrical and the subgrade construction for the 20,000 square yard maintenance and parking ramp is well underway. In addition, the company was committed to laterite pit operations and exploration, to construction support of a self-help company cantonment area at the airfield (roads, hardstands, security berms and bunkers and technical and equipment support for cantonment facility construction) and to operation of a batch plant (3 to 4 16S concrete mixers, averaging 75 cubic yards per day).

e. Company C expended its primary vertical construction effort in Camp Martin Cox (Bearcat), (CD 46-203/204-01-T-6A/6S), and in part produced 41,910 square feet of wood frame buildings. Its horizontal effort was primarily used for construction of 20,245 square yards of new roads and parking areas for Long Thanh North Airfield. Notable structures include the main 5,720 square foot APO facility for the 9th Infantry Division, a 4,000 square foot air-conditioned library, 12,000 square feet of covered storage, the nearly completed erection of a 75' x 202' pre-engineered aircraft maintenance hangar and additional support facilities. In addition, the company provided project support for all self-help construction in the division base camp, including the operation of a concrete batch plant and prefab yard.

f. At the start of this period, Company D was fully committed in the Bearcat area for construction. The home cantonment for the "Queen's Cobra" Regiment of the Royal Thai Army was a joint venture of Company D and the Thai engineer company. Conversion of a flat, poorly drained area into a cantonment during the monsoon season presented engineering opportunities and challenges for all who participated. Roads, hardstands, drainage structures, power lines, latrines, showers, mess halls, PX, and tent frames, all grew above the ever-increasing depth of the mud and slime with antagonizingly slow progress. Other contributions to Bearcat by Company D include the construction of 2 each 21,000 gallon elevated bolted

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stool tanks and associated pumping stations to serve as potable water-truck facilities; following the completion of the Thai area, erection of a pre-engineered 4,000 square foot warehouse, and construction of mess facilities. The stop-up of airfield construction profited by D Company's efforts in horizontal construction, (backfilling of the east runway over run, and construction of access roads), and in the vertical construction of mess, administrative, support and operational facilities. For battalion and self-help general support, D Company operated a prefab yard and laterite pit.

g. On 12 August 1967, the 67th Engineer Company (DT) moved to their present location, established a base camp and began to open an operational quarry. They have, with the mutual support of the A Company quarry section, operated a blast rock quarry which has produced 11,133 cubic yards of rock. This rock has been hauled 5 miles to form a causeway (XS377574) as part of the upgrading of Route 15, north of Vung Tau. VC activity in the area has limited quarry operations to daylight hours and necessitates that all equipment be removed from the site and secured in the base camp at night. The haul route passes through the congested town of Ba Ria. Despite this limitation and the availability of only one rock drill, causeway construction has progressed at a rate much faster than anticipated. The 67th Engineer Company (DT), completing their first three months as part of the 93d Engineer Battalion has demonstrated their ability to "Build With Pride".

h. Training. (1) OJT/MOS training has, of course, been continuous and daily.

(2) Personnel are trained, as necessary, on weapons used by the battalion in the security mission. Infused personnel were trained in the use of M-16, M-79, claymore, hand held pyrotechnics and starlight scope. Personnel have completed test firing of individual weapons.

(3) Classes on artillery fire adjustment have been given to officers and NCO's. Each individual must be able to adjust fire with and without FDC support.

(4) Religious training in the form of services and character guidance have been made available.

(5) A vigorous program is underway to allow, those interested, participation in GED and ACE testing and night classes.

(6) The most effort has been spent on maintenance training. Well trained by normal standards, the rigors of mud, heat, rain and long hard hours of operations required a reorientation. Classes on operation and maintenance were held on such equipment as wheeled tractors and scrapers, tracked tractors, scoop loaders and winches. Those classes

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paid dividends. The USARV announced acceptable deadline rate was reduced by Group to 7 percent overall and 3.5 percent for items defined as critical. The battalion was commended for being first in the Group to attain the goal.

1. A significant operational mission of the battalion is security of the Long Thanh North Airfield Complex. An infantry company was employed in the security prior to the mission assignment to this headquarters. The balance of security force vs construction requirements and calculated risk is under continual evaluation. As the construction bears facilities, the security requirements increase. As the security force increases the construction effort decreases. Current security cost is the equivalent of one construction platoon each day in lost time and a guard force the size of Company A (175) each night.

#### 5. LOGISTICS:

a. The supply of construction materials to a battalion gearing for maximum production has been a golden opportunity for supply personnel to apply every trick of the trade in a short, hectic period. Starting without any available stock, and little lead time for procurement, the S-4 was able to deliver the following supplies:

- (1) 50,000 bags of cement
- (2) 17,000 sheets of corrugated metal sheeting
- (3) 99,000 pounds of nails
- (4) 2,161,000 board feet of lumber
- (5) 4,000 feet of corrugated culvert
- (6) 202,000 feet of electrical wire
- (7) 35,000 cubic yards of sand and aggregate

b. Material Handling Equipment: Two fork lifts were obtained on temporary loan during the period. The addition of this equipment increased the materials handling capability of the battalion by 200 percent and freed cranes to be used in the construction effort of the battalion.

c. Supply Accounts: Finding materials is a major challenge in Vietnam, especially for a unit located a long distance from sources of supply. This battalion, on a daily basis, hauls materials from Saigon (60KM one way) and two locations in Long Binh (20 to 30KM one way). In addition materials and supplies are obtained from four other locations in Saigon and Long Binh at least once a week. All locations must be checked

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regularly for materials. Periodic shortages in the Saigon area have necessitated tactical convoys to Vung Tau. Security has been provided by the 9th Infantry Division, a major customer of the battalion. Convoys average twice a week and are made up of from 20 to 40 vehicles. As many as three convoys have been run in a ten day period. Personnel have been dispatched as far as Qui Nhon in search of critical supplies. The coordination necessary for air movement of supplies is an additional logistical problem handled by the battalion.

d. **Supply Organization:** The S-4 Section, augmented by the utilities section, bears little resemblance to the TO&E. Tactical considerations require two individuals to accompany each truck on supply runs, drawing heavily on available manpower. The operation of a Clothing Central Issue Facility, a warehouse, two Class IV yards, a ration breakdown and two forklifts pulls additional people from their assigned positions. To assure continued flow of supplies, one or two men have been assigned to live at depots full time and coordinate loading operations at that end. The Communications Officer has been assigned the extra duty of Assistant S-4, thus adding necessary depth to the section. He functions primarily as an expeditor, responding to critical shortages and immediate problems. In the office he oversees the accounting of the Class IV materials and the submission of periodic and one-time reports. The assignment of the plumber and electrician from the utilities section to the warehouse has provided the battalion with knowledgeable personnel capable of substituting construction materials on hand for those requested.

e. **Communications:** The search for supplies keeps the S-4 on the road most of the time. Early in the reporting period a radio was transferred from A Company to the S-4. The ability to communicate between depots and home station while on the move allows the S-4 to maintain some control over his operation and speed the pick up of supplies.

6. **FORCE DEVELOPMENT:** During the period recommendations were submitted to higher headquarters for a Modified TOE. The battalion commander was selected to represent the 34th Engineer Group on the Brigade Planning Committee for the Construction Battalion.

7. **COMMAND MANAGEMENT:** After the initial settling in, an aggressive program of command management inspections was initiated. Each month every company is evaluated by the battalion staff in the areas of:

- a. Mess
- b. Supply operations
- c. Maintenance operations

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- d. Construction management
- e. Unit administration
- f. Savings program
- g. Safety program
- h. Reenlistment

Points are also earned for:

- a. Engineer Soldier of the Month
- b. Mechanic of the Month
- c. Operator of the Month
- d. Soldier of the Month
- e. Specialist Five of the Month

The evaluation of these areas monthly culminates in awards for Best Mess and Best Company of the Month. Using these tools and a weekly inspection of selected areas by the Battalion Commander more efficient functioning of the organization is assured.

8. INSPECTOR GENERAL:

- a. The AGI of the 67th Engineer Company (DT) was postponed.
- b. No IG inquiry was received during the quarter.
- c. The AGI for the battalion has been scheduled for April 1968.

9. INFORMATION: When competing with the combat and combat support missions of other units, the activities of an engineer construction battalion building a structure or facility from the earth and raw materials against the elements is not considered particularly newsworthy. Undaunted, 48 hometown news releases were submitted in the last two months and fifteen public information stories have been written about the battalion's construction accomplishments. Most of the stories have already been published in at least one of the in-country news media.

10. CIVIC AFFAIRS: What can a battalion contribute to an area where an infantry division is taking care of the people? Not waiting for the answer, the battalion in coordination with the division, local advisors and

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the Vietnamese people embarked on an energetic program. With the requirement to work sun up to sun down seven days a week, and since it isn't healthy to be out at night, construction in support of the people's program was limited to Sunday morning. Laterite was delivered to stabilize a TV viewing area, construction has begun on a classroom extension, playground equipment has been built, empty drums and scrap lumber converted into homes for displaced families. Distribution of three hundred pounds of clothes and two hundred bars of soap from members of the battalion and stateside organizations has been made to the people in the Long Thanh area. 14

b. Still a major contribution is made by a few. The medical section, on weekly MEDCAP trips, has treated over 1,000 Vietnamese men, women and children. In addition, the battalion dispensary treats an average of five Vietnamese employees each day and has administered both day and night to civilians that have been injured in the area. In conjunction with the battalion civic construction program arrangements have been made for funds, materials and plans for the expansion of a local dispensary by a 10 bed obstetrical ward. Battalion participation is gaining momentum in the civic action area.

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SECTION 2. PART I. OBSERVATIONS (LESSONS LEARNED)

1. PERSONNEL: None

2. OPERATIONS:

a. ITEM: There is a danger of fire or explosion connected with heating of asphaltic materials.

DISCUSSION: Flash points of materials should be determined and temperature gauges should be checked to insure that they are working properly prior to heating beyond the flash point. Overflow should be kept free of obstruction and loading hatches should be closed during heating with the asphalt distributor model D-32 to prevent material from boiling over.

OBSERVATION: A few simple precautions can preclude serious fire damage from exploding asphaltic material during heating process.

b. ITEM: Penoprime

DISCUSSION: Penoprime has been found to be a very good dust palliative if placed properly. A lot of penoprime, however is wasted because it is placed improperly or it is not allowed to cure once it is placed. In some cases, the road surfaces that were covered were not properly prepared and consequently the penoprime did not do the desired job. In other cases, traffic was allowed on the surface before the penoprime cured thus causing poor results.

OBSERVATION: Shape, compact, apply a little moisture, penoprime and keep traffic off the area for 24 to 48 hours is possible.

c. ITEM: Use of UCAR 131 in bituminous distributors.

DISCUSSION: When UCAR 131 is allowed to stand for more than an hour, it will set up and cause blockage of hoses and spray bars.

OBSERVATION: Do not fill distributor with UCAR 131 until ready for operation. When through operating, flush the hoses and distributor with water to prevent blockage.

d. ITEM: Batten Strips

DISCUSSION: Possibly the biggest problem encountered in the use of batten strips for siding is splitting of the strips. If the lumber used for the strips is not completely dried before it is emplaced, the drying process will cause the lumber to split.

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OBSERVATION: To prevent the splitting of the batten strips, one edge of the strip can be nailed and the other edge remain free for a few days. This process allows the wet lumber to dry (shrink) without splitting. After the lumber is sufficiently dry, the remaining edge of the board can be nailed. This process will reduce batten strip splitting to a minimum. 16

e. ITEM: Installation of low profile light covers

DISCUSSION: A problem developed when the incandescent light fixtures around the outside of a building were required to be covered. The light cover would not be secured to the ove panelling because the light fixture extended too far below the overhang.

OBSERVATION: The problem was solved by cutting a hole in the ove panelling and placing the light fixture above the panelling. The light cover could then be secured properly.

f. ITEM: Erecting and tamping of poles

DISCUSSION: Leaving utility poles in an angled position after erection weakens the soil around the pole, making tamping at a later date more difficult.

OBSERVATION: Erect and tamp utility poles simultaneously whenever possible.

g. ITEM: Use of earth auger in poorly drained terrain

DISCUSSION: A highly mobile earth auger can be made by mounting the auger on the rear of a 10 ton attachment trailer and employing a D-7E as the prime mover. This system has proven to be very successful in the installation of utility poles in muddy areas where a truck mounted earth auger could not negotiate. Care must be taken in backing the trailer, as the trailer eye may break if undue strain is placed upon it.

OBSERVATION: An earth auger mounted on a 10 ton trailer, pulled by a dozer, will effectively operate in a muddy area.

h. ITEM: Installation of stand-off insulators

DISCUSSION: When stand-off insulators are mounted prior to erection, care must be taken when erecting the pole to insure that the insulator isn't bent from accidental contact with the ground, and that they are oriented correctly with the direction of the line.

OBSERVATION: Mounting of stand-off insulators prior to erecting the utility pole saves many man-hours of lineman time.



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i. ITEM: Boring of drift holes through base plates

17 DISCUSSION: Boring a timber of 12 inch thickness or more requires much patience. With the length of timber that the bit must pass through, the bit tends to "ride" over knots, etc. in the timber, such that, even though the hole was started correctly, the exit hole may be off center.

OBSERVATION: First drill a small hole, then enlarge it several times with a larger and larger diameter bits.

j. ITEM: Drainage of fillstand area

DISCUSSION: Even though a tankor can be filled by dipping the fillpipe hose directly into the waiting tank, spillage is inevitable, and standing water will build up very fast around the fillstand area unless provision has been made for excellent drainage. This spillage, combined with the constant traffic under the fillpipe will ruin the roadway completely in a matter of a few days.

OBSERVATION: Care taken in insuring that a comprehensive plan of drainage is provided for the fillstand roadway will save much road maintenance later.

k. ITEM: Insuring even bearing of a water tank against the floor of the tower

DISCUSSION: Because 21,000 gallon prefabricated tanks are bolted on all sides and top and bottom, the bolts themselves will rest on the tower decking instead of the tank resting on it, causing the base of the tank to distort, and thereby leak. Installation of a 2 to 3 inch sandbox slightly larger than the diameter of the tank will insure even bearing against the tower deck. Additionally, after the tank is assembled, sand can be moved along the tank perimeter to facilitate retightening of the bolts. Such a task is impossible if the tank rests on the tower deck itself since retightening requires that both the bolt and the nut be held with wrenches. The sandbox concept allows the bolt underneath to be reached by moving a limited amount of sand out of the way.

OBSERVATION: A sand base for the 21,000 water tank not only provides a better base for the tank but facilitates assembly of the tank itself.

l. ITEM: Stockpiling Construction Material

DISCUSSION: Often two or more prefab buildings are shipped and stockpiled at the same project site. One of the buildings is to be constructed immediately and the other at a later date. Many times the

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bundles of components of the several buildings are intermingled. Sometimes the parts get shuffled around and get lost in the stockpiles. Often the organization constructing the first building takes the required parts for their project from the remaining building. This type of careless selection and care of material leads to broken and missing components to the remaining buildings in the stockpile.

OBSERVATION: One solution to the problem is to keep the buildings separated and make proper inventories. The inventories should be conducted before erection of the first building. When parts are found missing they must be ordered immediately, therefore preventing a possible slowdown of a project.

m. ITEM: Ring footers

DISCUSSION: Placing concrete slabs during the rainy season induced several problems because the slabs had to be covered to avoid impairment from the rains. Since coverage material was in short supply, the developed solution was the pouring of "Ring Footers".

OBSERVATION: The "Ring Footers" consisted of pouring ring of concrete approximately 24 inches wide around the entire perimeter of the proposed slab of concrete. With this "Ring Footer", the building frame and roof can be constructed and the remaining slab placed after completion. This method accelerated construction and provided shelter to the slab.

n. ITEM: Concrete "High Chairs"

DISCUSSION: Many areas throughout South Vietnam are rock-free, and rock cannot be found to elevate reinforcing mesh or re-bars off the ground. One possible solution to the problem was to mold concrete blocks (1"x4"x4") and use them as "High Chairs". A template can be made so as to make 144 to 169 blocks at a time. Heavy grease should be spread within the template so the blocks can be removed once cured. Maintenance of the template should be of a meticulous nature, therefore rendering it useful for more than one casting.

OBSERVATION: Use of concrete "High Chairs" will result in more accelerated and accurate placement of wire mesh.

o. ITEM: Laterite

DISCUSSION: The fact that laterite is a good construction material has certainly been confirmed by engineering units in South Vietnam. However, proper placement methods have to be exercised if laterite is to be used effectively.

OBSERVATION: Experience has shown that laterite can best

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be placed in lifts from four to six inches in thickness. Each lift has to be compacted and graded before the next lift can be placed. A slope or 1 1/2% to 2% has been found to be sufficient to afford drainage and will ~~be sufficient to afford drainage and will~~ not be so steep that vehicles slide off the surface when it is wet. Laterite must be allowed to dry or it will fail once traffic is placed on it. If proper placement methods are used and proper drainage is provided, laterite can be used effectively for any type of earth construction.

p. ITEM: A simple, safe and quick method for assembling and installing tank, liquid, 250 barrels, 5430-263-6080.

DISCUSSION: The tank can be layed out on a flat portion of ground and assembled as per the instructions on ground level. When the tank is completely assembled all of the bolts have to be tightened up snugly by working from the center of the bottom out to the sides, around the bottom seam, up the side seams, around the top seams and into the center of the top. The tank can easily be lifted with a 20 ton truck mounted crane. All one has to do is place three 4x4 beams inside the center hatch and put the sling around the beams. One must hold the beams in place until tension is applied to the sling. When the tank is in position all the bolts have to be tightened especially around the multiple joints. To plug the tiny, persistent leaks a small amount of clean sand and laterite should be poured around the inside of the tank near the seams.

OBSERVATION: When the tank is layed on flat ground it is easy to work and the needed care can easily be taken in the positioning of the gaskets. The absolute perfect positioning of the gaskets is necessary for a tight tank. By lifting the tank from the center as proscribed it can be easily controlled and positioned with tag lines. A 20 foot lift with a 60 foot boom is no problem. The silt and sand particles gravitate into and plug the smaller leaks.

q. ITEM: Sawdust protection for Dewalt Saws

DISCUSSION: Some problems have been encountered with the motors of the Dewalt Saw. The main cause of the problem has been sawdust getting in and around the motor.

OBSERVATION: A partition made of masonite was placed between the saw and the 10KW generator on the saw. The partition acts as a shield and keeps the sawdust from reaching the motor.

r. ITEM: Pouring large concrete pads

DISCUSSION: In pouring large concrete pads, one of the biggest problems is transporting the concrete from the carrier to the location where it is to be placed.

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OBSERVATION: In order to gain speed and make the concrete placement easier for the personnel involved, one end of the form was left open. The carriers (in most cases five ton trucks) could be backed to the far end of the pad to dump the concrete. When the far end of the pad was poured the pad forming was completed and the other end was poured. By leaving one end of the pad open it was not necessary to transfer the concrete from the truck to wheelbarrows and then to the location of placement.

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s. ITEM: Siding for Pasco Prefabricated Sheds

DISCUSSION: In order to place a corrugated siding on Pasco prefabricated sheds, it was first necessary to build a framework to which the siding could be nailed.

OBSERVATION: During the construction of the framework, 2"x4"s had to be placed in the I-beam of the main structure. The 2"x4"s were to be secured to the web of the I-beams by drilling a hole through the web and the 2"x4"s. Due to the lack of the correct size bolts, the 2"x4"s had to be secured in a different manner. The 2"x4"s were placed against the flange of the beam. A smaller piece of 2"x4" was wedged between the main 2"x4" and the second flange of the beam. The wood framework was thus secured to the steel structure.

t. ITEM: Discharge hose on Centrifugal pump

DISCUSSION: Trouble has been encountered with the discharge hose on centrifugal pumps. The hose collapses at the point where it connects to the discharge line of the pump. (EIR pending)

OBSERVATION: The problem was solved by placing a 45 degree or a 90 degree elbow at the point where the hose connects to the pump. A bend in the hose was eliminated thus allowing discharge fluid to pass easily.

u. ITEM: Keyways for concrete

DISCUSSION: Some difficulty has been encountered in removing keyways from concrete pads. They have had to be chipped out or the concrete has been broken when the keyway was removed.

OBSERVATION: A 2"x4" was cut at a 45 degree angle on both sides so that a trapezoidal shape was formed. A wire was then connected to the 2"x4" block. After the concrete was poured and cured, the keyway was easily removed by pulling out the block with the wire.

v. ITEM: A method to use the round fire bomb container as a water container for showers

DISCUSSION: The bomb container has a reinforcing rib, a

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pressure band and the welded edge of the end piece in an overlapping arrangement that is very hard to seal in order to use the tank to store water, especially if the bomb container is old and the original gaskets are gone. To alleviate the problem cut the end of the container off inside the reinforcing rib, cut a piece of plate steel the size of the end of the container and weld the sheet steel to the end of the bomb container, making a completely new end for the bomb container.

OBSERVATION: The above method of making a fire bomb container into a useable water container will save a great deal of time and effort.

### 3. TRAINING AND ORGANIZATION

ITEM: The TO&E organization works best

DISCUSSION: During the stateside training it was decided to organize the construction company along the functional or labor union lines. Training and initial in-country construction was accomplished with this organization. The mason unit formed and poured the slab and foundation, the carpenter platoon erected the building and the electricians placed the wiring. Many problems of management were present.

OBSERVATION: The TO&E organization of a construction platoon allows flexibility, provides a singular control of projects, fosters a sense of pride in a unit mission well done, allows cross training of MOS and trains future construction foremen. These advantages are not available in the functional organization.

### 4. INTELLIGENCE

ITEM: No one else is interested in how much you know about what is going on around you.

DISCUSSION: Coordination is a word requiring a lot of time and does not allow the use of "assume". Case in point: Every coordination had been made to assure that the battalion knew of any planned activity around the Long Thanh North Airfield by friendly units. One night, after a short recon by fire from battalion security elements into the nearby rubber plantation, a very shaky voice was heard in the field phone to say "I have an ambush patrol in the area where you are firing. Are you shooting at it?" answer "The fire is in an area clear of any known patrol activity, if they weren't moving before tell them don't."

OBSERVATION: The unit had coordinated a training patrol in the AO. For some reason the coordination was not passed to this battalion. A relationship with every unit possible will insure the best coordination. The more sources the more information and the better chances of survival but you cannot wait for it to come to you, go get it.

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## 5. LOGISTICS

ITEM: Required board lengths of lumber

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DISCUSSION: Bills of Materials were made out for each facility and the lumber ordered accordingly. The depots did not allow requisitions to be placed for a particular length of lumber; therefore the board foot on the BOM was usually under estimated due to the random length of lumber received.

OBSERVATION: A high stockage level must be maintained on fast moving sizes of lumber in order that there are sufficient sizes of lumber of all lengths on hand to properly fill each BOM, with minimum waste.

## 6. OTHER

a. ITEM: Parking brake on CAT 12 Grader

DISCUSSION: The parking brake on a cat grader will not function properly when the grader is operated in mud and water. Foreign material gets into the brake drum causing it to rust and eventually lock.

OBSERVATION: The parking brake can be maintained by taking off the drum and lubricating all moving parts. The moving parts are usually lubricated during quarterly services since the operator does not have a wrench that will fit the 2 5/8 nut on the brake drum. A box wrench can, however, be fabricated by the unit welder so that the operator can lubricate the parking brake whenever necessary.

b. ITEM: Towing aggregate spreaders, model M5

DISCUSSION: When towing aggregate spreaders over great distances the continuous bouncing will cause hold down chains to loosen.

OBSERVATION: Frequent stops to check the hold down chains will prevent the spreader from falling off carrier wheels.

c. ITEM: 290M air filters

DISCUSSION: The shortage of parts in Vietnam has many times caused the downlining of equipment for long periods of time. One instance is the non-availability of air filters for the 290M earth movers. Due to the large amount of dust in Vietnam, the filters were being used at a very fast rate.

OBSERVATION: One method of extending the life of a filter is to blow out the filter instead of throwing it away. If the filter is cared for properly its life can possibly be doubled. Care must be taken

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in not allowing equipment operators to damage the filter with excessive air pressure.

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d. ITEM: Air leak in hydraulic system of D-7E dozer causes the transmission to drop out of forward drive while climbing a grade.

DISCUSSION: It was impossible to detect the location of the leak.

OBSERVATION: Removing the torque converter and transmission, replacing all packings from the hydraulic oil sump to the hydraulic oil pump and sealing all the junctions with Grade 3 Permatex eliminated the air leak and the transmission problem.

e. ITEM: Rock guard on the D-7E tractor

DISCUSSION: The lower rock guard on the D-7E tractor kept coming loose until the flat washers were replaced with lock washers.

OBSERVATION: Replacement of the flat washers with lock washers solved the problem of the loosening bolts.

f. ITEM: Wearing of brake shoes

DISCUSSION: Due to extreme mud and slush on haul roads during the rainy season, there is a constant problem with mud getting between the brake shoes and the brake drums. This causes brake shoes to wear out extremely fast.

OBSERVATION: Well drained haul roads and frequent wheel cleanings will help save the 4 ton dump truck brake shoes.

g. ITEM: Fuel line of the 290M tractor

DISCUSSION: The return fuel line on the 290M tractor is made of a high tempered steel tubing. From constant vibrations occurring during operation of the 290M, the tubing will crack and leak. (EIR submitted)

OBSERVATION: By replacing all return lines with the rubber brake lines used on the front wheels of a 2 1/2 ton truck, the problem has been eliminated.

h. ITEM: Number 4 fuel line failure

DISCUSSION: The fuel line for Number four cylinder has, in many cases, failed on 5 ton multifuel engines.

OBSERVATION: Repairing the broken fuel line has proven

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to be extremely satisfactory. This can be done only if the fuel line has broken at the fitting or close to it and the line is available for repair. The procedure requires drilling out the old line from the sleeve and with a suitable tool, drive or press the sleeve back on the main part of the line after dressing up any rough edges that may be on the line. After the sleeve has been driven on the line with the same amount of line extending through, use a torch and heat just enough to allow solder to flow. It is recommended that solder paste or acid be used to insure a good bond. A slight amount of boning will have to be done in order to get the line to fit properly to the injector pump and injector.

1. ITEM: Tractor - Clark 290M and Loader - Hough H90 starting motor.

DISCUSSION: These starting motors are in short supply.

OBSERVATION: Starting motors for a 5 ton multifuel will fit the above equipment with a slight modification of the pinion drive assembly. When the pinion drive assembly is changed for the Loader, Scoop-Hough H90, a bushing must be made to reduce the pinion drive sleeve to fit the shaft of the multifuel starting motor.

j. ITEM: Hydraulic lines (11083) 3R2925 & (11083) 3R2926 for Blade Lift Ram on D-7E Tractor

DISCUSSION: The above items are supply coded X2.

OBSERVATION: A suitable substitute for the metal tube assembly is the rubber hose assembly, parts number 70-434-205L4, used on the model CT4 Lolourneau-Westinghouse Scraper - 18 Yard. The substitute hose is exceptionally effective for quarry operations and land clearing operations.

k. ITEM: What items are necessary for a MEDCAP operation?

DISCUSSION: For security reasons the destination of a MEDCAP operation is not known until movement has begun. A basic load for 200 patients is a good figure and can be carried in a 3/4 ton truck.

OBSERVATION: The following list has been developed from the last quarter experience.

Bactitracin ophthalmic ointment - 12 tubes.  
Cortisporin - 12 bottles  
Tetracain ophthalmic ointment - 12 tubes  
Hydrogen peroxide - 2 pints  
Cough syrup - 1 gallon  
Gelucil - 2 pints



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Mom - 1 pint  
Piperazino - 2 cans  
Aspirin - 1,000 tablets  
Infant vitamins - 20 bottles  
Adult vitamins - 10 bottles  
Ferrous Sulfate - 1,000 tablets  
Penicillin tablets - 200 tablets  
Tetracycline syrup - 2 pints  
Phisohex soap - 1 gallon  
Morthiolate - 1 pint  
Bactracin ointment - 12 tubes  
Hydrocortisone cream - 12 tubes  
Soap - 20 bars  
Tetracaine - 2 tubes  
Furacin solution - 1 pint  
Band aids - 1,000  
4x4 gauze - 500  
Tape - 2 rolls  
Ace bandages - 10  
Surgical sets - 1  
Local anesthetic - 1 bottle  
Thermometers - 11  
Examining instruments  
Water - 5 gallons

SECTION 2. PART II. RECOMMENDATIONS. - NONE

*C. W. Guth*  
C W GUTH  
LTC, CE  
Commanding

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27 EGF-OP (13 Nov 67) 1st Ind MAJ Dorris/tma/VTU 2987  
SUBJECT: Operational Report - Lessons Learned (RCS CSFOR-65) for  
Quarterly Period Ending 31 October 1967

Headquarters 34th Engineer Group (Const), APO San Francisco 96291,  
21 November 1967

TO: Commanding General, 20th Engineer Brigade, ATTN: AVBI-OPN,  
APO 96491

This headquarters concurs with the 93d Engineer Battalion's  
ORLL Report.

FOR THE COMMANDER:



W C TOMSEN  
Major, CE  
Adjutant

Copies furnished:  
ACSFOR-DA  
CO, 93d Engr Bn

AVBI-OPN (13 Nov 67) 2nd Ind  
SUBJECT: Operational Report - Lessons Learned (RCS-CSFOR-65) for quarterly  
Period Ending 31 October 1967

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DA, Headquarters, 20th Engineer Brigade, APO 96491, 27 Nov 67

TO: Commanding General, USAECV(P), Attn: AVCC-P&O, APO 96491

1. The subject report submitted by the 93rd Engineer Battalion has been reviewed by this Headquarters and is considered comprehensive and of value for documentation and review of the reporting units activities and experiences.

2. This Headquarters concurs with the submitted report, as modified by the 1st indorsement.

FOR THE COMMANDER:



CECIL D. CLARK  
Major, CE  
Adjutant

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CO, 93rd Engr Bn

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AVCC-P&O (13 Nov 67) 3rd Ind  
SUBJECT: Operational Report-Lessons Learned (RCS CSFOR-65) for quarterly  
Period Ending 31 October 1967

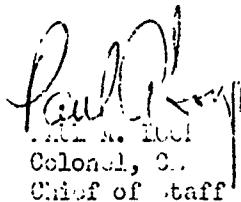
HEADQUARTERS, UNITED STATES ARMY ENGINEER CORPS  
VIETNAM (PROV), APO 96491 7 DEC 1967

TO: Commanding General, United States Army Vietnam, APO 96375  
APO 96375

The subject report, submitted by the 93rd Engineer Battalion, has been reviewed by this headquarters and is considered adequate.

Reference Section 2, Part I, paragraph 6c, page 20, item concerning 290L air filters. Nonconcur, paragraph 3-64, 2, TM 502420-200-15, dated June 1967 states that dirty air filter element must not be cleaned for reuse as a small hole could allow excessive dust to bypass the filter and get into the engine. Action has been taken by 1st Logistical Command to increase the stockpile of air filter elements for the Clark 290L tractors. A warning not to reuse the elements will be published in the next issue of the USACV(P) Maintenance Newsletter.

FOR THE COMMANDER:

  
PAUL H. ROOT  
Colonel, G.  
Chief of Staff

Cys turn:  
CC, 2nd Engr Bde  
CC, 3rd Engr Bde  
C, 93rd Engr Bn

"THIS COPY OF THE REPORT IS TO BE  
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SUBJECT: Operational Report-Lessons Learned (RCS CSFOR-6S) for  
Quarterly Period Ending 31 October 1967

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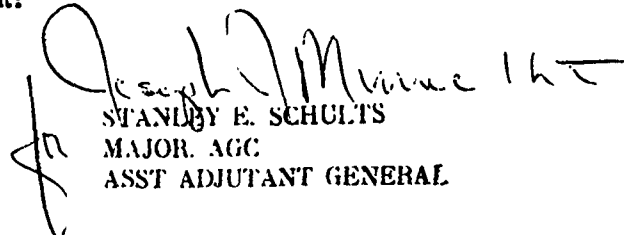
HEADQUARTERS, UNITED STATES ARMY VIETNAM, APO San Francisco 96375 9 DEC 1967

TO: Commander in Chief, United States Army, Pacific, ATTN: GPOP-DT,  
APO 96558

1. This headquarters has reviewed the Operational Report-Lessons Learned for the quarterly period ending 31 October 1967 from Headquarters, 93d Engineer Battalion (Construction) (D3WA) as indorsed.

2. Concur with report as indorsed. Report is considered adequate.

FOR THE COMMANDER:

  
STANLEY E. SCHULTS  
MAJOR. AGC  
ASST ADJUTANT GENERAL

cc: HQ, 93d Engr Bn (Const)  
HQ, US Army Engr Comd

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GPOP-DT(13 Nov 67) 5th Ind  
SUBJECT: Operational Report for the Quarterly Period Ending 31 October  
1967 from HQ, 93d Engr Bn (Const) (UIC: WD3WAA) (RCS CSFOR-65)

HQ, US ARMY, PACIFIC, APO San Francisco 96558

20 DEC 1967

TO: Assistant Chief of Staff for Force Development, Department of the  
Army, Washington, D. C. 20310

This headquarters has evaluated subject report and forwarding  
indorsements and concurs in the report as indorsed.

FOR THE COMMANDER IN CHIEF:



K. F. OSBOURN  
MAJ, AGC  
Asst AG

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